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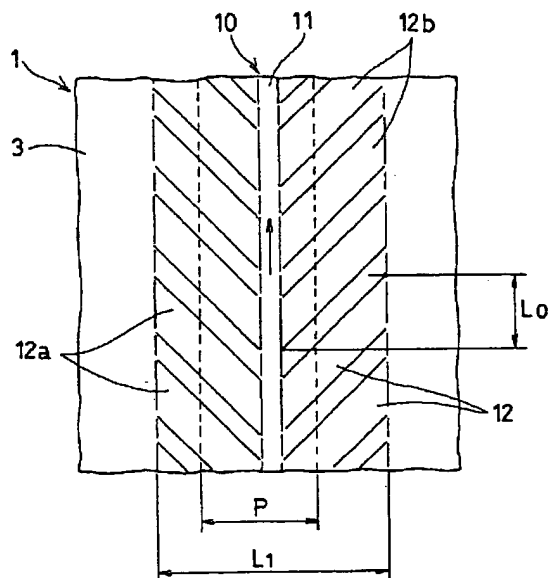
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(54)【発明の名称】 段ボール紙の折曲げ用罫線および罫入れ装置

(57)【要約】

【課題】 高精度に折曲げることができる罫線を提供する。

【解決手段】 折曲げ時に内側となる面からの押し潰しによって直線状の折曲げ基線部 11 を形成する。その折曲げ基線部 11 の両側に押し潰しによって傾斜状の補助線部 12 a、12 b を折曲げ基線部 11 の長さ方向に所要の間隔をおいて設け、折曲げ基線部 11 の両側の補助線部 12 a、12 b を逆向きに傾斜させ、上記補助線部 12 a、12 b により折曲げ基線部 11 の両側部分の強度を弱めて折曲げの容易化を図り、折曲げ基線部 11 に沿う折曲げ精度の向上を図る。



【特許請求の範囲】

【請求項1】 段ボール紙の折曲げ時に内側となる面からの押し潰しによって形成された直線状の折曲げ基線部と、折曲げ時に内側となる面からの押し潰しによって上記折曲げ基線部の両側に沿って所要の間隔をおいて設けられた傾斜状の一对の補助線部とから成り、上記折曲げ基線部の両側の補助線部を逆向きに傾斜させた段ボール紙の折曲げ用野線。

【請求項2】 前記折曲げ基線部の両側に設けられた補助線部の外端間の長さを、段ボール紙の波状中芯における山のピッチ以上とした請求項1に記載の段ボール紙の折曲げ用野線。

【請求項3】 前記補助線部を隣接する補助線部に対して前記折曲げ基線部の長さ方向にオーバーラップさせた請求項1又は2に記載の段ボール紙の折曲げ用野線。

【請求項4】 平板状のアンビルに対して相対的に移動されるダイボードに直線状の野線刃と、その野線刃の両側に沿って長く延びる帯状部材とを取付け、上記アンビルとダイボードとを相対的に移動させ、両部材間に供給された段ボール紙を上記野線刃によって野入れしつつ上記帯状部材によってその野入れ部の両側を押し潰すようにした段ボール紙の野入れ装置において、前記帯状部材の表面側に前記野線刃に対して傾斜する突条を帯状部材の長さ方向に所要の間隔をおいて設け、一对の帯状部材に形成された上記突条を互に逆向きに傾斜させたことを特徴とする段ボール紙の野入れ装置。

【請求項5】 前記帯状部材が弾性体から成ることを特徴とする請求項4に記載の段ボール紙の野入れ装置。

【請求項6】 前記アンビルに、逆野入れ用の直線状の膨出条を表面に有する帯板を、その膨出条が前記野線刃と対向するように取付けたことを特徴とする請求項4又は5に記載の段ボール紙の野入れ装置。

【請求項7】 アンビルシリンダに対向して設けられたダイシリンダに円筒状のダイボードを取付け、そのダイボードに取付けられた帯状の野入れ部材にダイボードの周方向に延びる野入れ用の突刃と、その両側に押し潰し用の一对の段部とを設け、上記アンビルとダイシリンダを逆回転し、その間に送り込まれてくる段ボール紙を上記突刃によって野入れすると共にその両側部を段部で押し潰すようにした野入れ装置において、前記野入れ部材における一对の段部表面側に、前記突刃に対して傾斜する突条を野入れ部材の長さ方向に所要の間隔をおいて設け、一对の段部における突条を逆向きに傾斜させたことを特徴とする段ボール紙の野入れ装置。

【請求項8】 前記一对の突条の外端間の長さを段ボール紙の中芯に形成された山のピッチ以上としたことを特徴とする請求項4乃至7のいずれかに記載の段ボール紙の野入れ装置。

【請求項9】 前記突条を、隣接する突条に対してオーバーラップさせたことを特徴とする請求項4乃至8のい

ずれかに記載の段ボール紙の野入れ装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、段ボール紙の折曲げ位置に入れられる野線および野入れ装置に関するものである。

【0002】

【従来の技術】一般に、段ボール箱は、図8（II）に示すブランクA₁からの折曲げによって形成される。ブランクA₁は、図8（I）に示すように、平行2条の横野線50を有する矩形段ボール紙A₁からの打抜きによって形成される。その打抜きと同時に、複数の縦野線51、52、53、54が設けられ、各縦野線51、52、53、54は、段ボール紙A₁を形成する波状の中芯2の山の長さ方向に延びている。

【0003】ブランクA₁は、普通、フォルダグリアに供給され、そのフォルダグリアによって縦野線51、53が折曲げられる。また、ブランクA₁に設けられたジョイントフラップ4は、塗布された接着剤を介してブランクA₁の端部に接着される。その接着によって、図8（III）に示すような扁平な段ボール箱Bが形成され、この段ボール箱Bは横野線50からの折曲げによって立体的に組立てられる。

【0004】寸法精度の高い段ボール箱Bを製造するには、ブランクA₁に設けられた縦野線51、52、53、54に沿って精度よく折曲げる必要がある。

【0005】ここで、縦野線51、52、53、54が、図9に示すように、ブランクA₁の中芯2における隣接する山2a間の2等分位置に設けられていると、その縦野線を挟む左右の形状は対称形であるため、左右部分の強度は略等しく、上記縦野線51、52、53、54に沿って比較的精度よく折曲げることができる。

【0006】ところで、縦野線51、52、53、54の形成位置は、中芯2aの隣接する山の2等分位置に設けられることはきわめて希であり、その2等分位置より左右に片寄った位置に設けられることが多い。この場合、縦野線51、52、53、54を対称線とする左右部分での形状は非対称となるため、左右部分での強度が相違する。このため、縦野線51、53に沿って段ボール紙を折曲げた場合、その折曲げ位置は強度の弱い方に片寄りが生じて精度よく折曲げることができず、図10（I）に示すように、上下の幅寸法が相違する段ボール箱B₁が形成されたり、あるいは図10（II）に示すように、ジョイントフラップ4の接着代に過不足のある段ボール箱B₂が形成され、寸法精度の高い段ボール箱を形成することができない。

【0007】段ボール紙A₁に縦野線を入れる野入れ装置として、野線刃の両側に沿って帯状部材を設け、上記野線刃の押し込みによる野入れ時に、上記帯状部材によって野入れ部の両側部分を押し潰すようにしたものが従

来から知られている。

【0008】しかし、上記野入れ装置においては、帯状部材の平坦な表面全体で段ボール紙を押し込むため、野線刃による野入れ位置の両側部分を完全に押し潰すことができず、この場合にも、野入れ部の両側部の強度が相違し、寸法精度の高い段ボール箱を形成することはできない。

【0009】上記のような問題点を解決するため、特開平9-70905号に記載された発明においては、段ボール紙に形成される野線を本線部と、その本線部に沿って設けられた隣接部とで形成し、上記本線部と隣接部のそれぞれを折曲げ時に内側となる面からの押し潰しによって形成している。

【0010】

【発明が解決しようとする課題】ところで、本線部と隣接部とから野線においては、上記隣接部が本線部に対して直交し、本線部の長さ方向に所要の間隔をおいて設けられているため、隣接部での折曲げ強度と、隣接部間での折曲げ強度とに差が生じ、長さ方向の強度は不均一である。このため、本線部が中芯の隣接する山の2等分位置から左右にずれが生じている場合に、隣接部間の強度は本線部の両側において異なり、フォルダグリアによって本線部を端から順に折曲げていく場合に、折曲げ位置が強度の弱い部分に移行していくことが考えられ、寸法精度の高い段ボール箱を形成するうえにおいて改善すべき点が残されている。

【0011】この発明の課題は、きわめて高精度に折曲げることができる野線および野入れ装置を提供することである。

【0012】

【課題を解決するための手段】上記の課題を解決するために、この発明に係る野線においては、段ボール紙の折曲げ時に内側となる面からの押し潰しによって形成された直線状の折曲げ基線部と、折曲げ時に内側となる面からの押し潰しによって上記折曲げ基線部の両側に沿って所要の間隔をおいて設けられた傾斜状の一对の補助線部とから成り、上記折曲げ基線部の両側の補助線部を逆向きに傾斜させた構成を採用している。

【0013】ここで、折曲げ基線部の両側に設けられた補助線部の外端間の長さは、段ボール紙の波状中芯における山のピッチ以上として、折曲げ基線部の両側に位置する中芯の山が上記補助線部によって確実に押し潰されるようにしておく。

【0014】上記補助線部の外端間の長さは、好ましくは上記山のピッチの2倍以上として、折曲げ基線部が山の頂部と対応する位置に設けられた場合に、その両側の山が補助線部で押し潰されるようにしておくのが好ましい。

【0015】また、補助線部は、隣接する補助線部にオーバーラップさせて、補助線部により折曲げ基線部の両

側部が全長にわたって略均一に押し潰されるようにしておくのがよい。

【0016】この発明に係る野入れ装置においては、平板状のアンビルに対して相対的に移動されるダイボードに直線状の野線刃と、その野線刃の両側に沿って長く延びる帯状部材とを取付け、上記アンビルとダイボードとを相対的に移動させ、両部材間に供給された段ボール紙を上記野線刃によって野入れしつつ上記帯状部材によってその野入れ部の両側を押し潰すようにした段ボール紙の野入れ装置において、前記帯状部材の表面側に前記野線刃に対して傾斜する突条を帯状部材の長さ方向に所要の間隔をおいて設け、一对の帯状部材に形成された上記突条を互に逆向きに傾斜させた構成を採用している。

【0017】上記帯状部材は、コルクや合成ゴム、あるいはその混合物から成る弾性を有するものであってもよい。

【0018】また、前記アンビルに、逆野入れ用の直線状の膨出条を表面に有する帯板を、その膨出条が前記野線刃と対向するように取付けてもよい。

【0019】さらに、この発明に係る野入れ装置においては、アンビルシリンダに対向して設けられたダイシリンダに円筒状のダイボードを取付け、そのダイボードに取付けられた帯状の野入れ部材にダイボードの周方向に延びる野入れ用の突刃と、その両側に押し潰し用の一对の段部とを設け、上記アンビルとダイシリンダを逆回転し、その間に送り込まれてくる段ボール紙を上記突刃によって野入れすると共にその両側部を段部で押し潰すようにした野入れ装置において、前記野入れ部材における一对の段部表面側に、前記突刃に対して傾斜する突条を野入れ部材の長さ方向に所要の間隔をおいて設け、一对の段部における突条を逆向きに傾斜させた構成を採用している。

【0020】

【発明の実施の形態】以上、この発明の実施の形態を図1乃至図7に基づいて説明する。

【0021】図1および図2に示すように、段ボール紙1は、波状の中芯2と、その表裏に接着されたライナー3とから成り、その段ボール紙1に折曲げ用の野線10が設けられている。

【0022】野線10は折曲げ基線部11と、その両側に沿って所要の間隔をおいて設けられた一对の補助線部12a、12bとから成る。折曲げ基線部11および補助線部12は、折曲げ時に内側となる面からの押し潰しによって形成され、上記折曲げ基線部11が中芯2に形成された山2aの長さ方向に延びている。

【0023】補助線部12a、12bは、上記折曲げ基線部11に対して傾斜し、一对の補助線部12a、12bは互に逆向きに傾斜している。また、補助線部12a、12bは隣接する補助線部に対してオーバーラップしている。Lはオーバーラップ量を示す。

【0024】一対の補助線部12a、12bの外端間の長さL₁は、中芯2の山2aのピッチP以上とされている。このため、折曲げ基線部11が隣接する山2aの2等位置からずれている場合でも、一対の補助線部12a、12bによって折曲げ基線部11の隣接する山2aが押し潰される。ここで、補助線部12a、12bの深さは折曲げ基線部11と同一深さであってもよく、それより浅くてもよい。また、一対の補助線部12a、12bは図示のように折曲げ基線部11を対称線として左右対称に設けてもよく、左側の補助線部12aと右側の補助線部12bとを折曲げ基線部11の長さ方向に位置をずらして形成してもよい。

【0025】折曲げ基線部11および補助線部12a、12bの幅寸法や深さ、補助線部12a、12bのピッチおよび傾斜角は、段ボール紙1の種類に応じて適宜に決定する。

【0026】上記のように、折曲げ基線部11の両側に沿って相対的に逆向きに傾斜する補助線部12a、12bを所要の間隔をおいて設けたことにより、折曲げ基線部11の強度は補助線部12a、12bの形成部位における強度より弱いため、段ボール紙1を折曲げ基線部11に沿って折曲げることにより、段ボール紙1は上記折曲げ基線部11を折れ筋として折曲げられる。

【0027】段ボール紙1の折曲げが進むと、図2(Ⅰ)に示すように、折曲げ基線部11の両側部が互に干渉し始める。

【0028】このとき、折曲げ基線部11の両側部における中芯2の山2aは、補助線部12a、12bによって押し潰されて強度的に弱く、その補助線部12a、12bは、隣接する補助線部12a、12bに対して折曲げ基線部11の長さ方向にオーバーラップしているため、折曲げ基線部11の両側部の強度は長さ方向において略平均化し、かつ両側部の強度は略同じ大きさとされる。

【0029】このため、折曲げが進み、折曲げ基線部11の両側部が互に緩衝し始めても、その緩衝部の強度は弱いため、容易に折曲げることができると共に、両側緩衝部の強度が略同じであるため、折れ筋にずれが生じるのを防止することができ、図2(Ⅲ)に示すように、折曲げ基線11に沿ってきわめて高精度に折曲げることができる。

【0030】上記段ボール紙1をフォルダグリアに供給し、その段ボール紙1を図1の矢印方向に移送させつつ、折曲げ基線部11をその移送方向の先端から順に折曲げる場合、一対の補助線部12a、12bは相反する方向に傾斜しているため、折曲げ時の応力は補助線部12a、12bと折曲げ基線部11の交差部に集中し、上記折曲げ基線部11に沿ってきわめて高精度に折曲げることができる。

【0031】図3に示すように段ボール紙1の折曲げ時

に外側となる面に折曲げ基線部11に対向して逆野線13を設けておくと、その逆野線13と折曲げ基線部11との間の強度はさらに弱くなるため、上記折曲げ基線部11に沿ってより高精度に折曲げることができる。

【0032】図4(Ⅰ)は、野入れ装置の実施の形態を示す。この野入れ装置は、平板状のアンビル20と、そのアンビル20に対向配置されたダイブレード21とを有し、アンビル20とダイブレード21とは相対的に移動されるようになっている。

【0033】ダイブレード21の下面にはダイボード22が取付けられ、そのダイボード22に帯状の野線刃23が植え込まれている。

【0034】野線刃23の刃先部23aはダイボード22の下面より下方に突出し、その突出部の両側に沿って帯状部材24a、24bが取付けられている。

【0035】図5(Ⅰ)、(Ⅱ)に示すように、帯状部材24a、24bは、ゴム、コルクあるいはその両者の混合物等を素材とする弾性体から成り、その表面は傾斜面25とされている。傾斜面25にはその長さ方向に所要の間隔をおいて傾斜溝26が形成され、隣接する傾斜溝26間に傾斜状の突条27が設けられている。

【0036】突条27は、隣接する突条27と帯状部材24a、24bの長さ方向にオーバーラップしている。また、突条27は、他方の帯状部材に形成された突条27に対して逆向きに傾斜している。ここで、野線刃23の両側の突条27は、上記野線刃23を対称線として左右対称に設けてもよく、野線刃23の長さ方向に位置をずらして形成してもよい。

【0037】いま、アンビル20上に段ボール紙1を供給した状態において、そのアンビル20とダイブレード21を相対的に接近する方向に移動させることにより、図4(Ⅱ)に示すように、段ボール紙1は野線刃23によって押し潰されて筋状に野入れされる。また、野入れ部の両側は帯状部材24a、24bにより押し潰されると共に、突条27によって傾斜状の押し潰し溝が入れられ、図4(Ⅱ)に示すように、折曲げ基線部11と補助野線部12a、12bとが設けられている。

【0038】図6(Ⅰ)は、野入れ装置の他の例を示す。この野入れ装置は、ダイブレード21に取付けられたダイボード22に野線刃23と、金属から成る一対の帯状部材30、30とを植込み、各押し潰し部材30、30と野線刃23との間にスペーサ31を圧入している。

【0039】また、図6(Ⅱ)に示すように、帯状部材30に円弧状端面32を形成し、その円弧状端面32の長さ方向に所要の間隔をおいて傾斜溝33を形成し、隣接する傾斜溝33間に傾斜状の突条34を設けている。

【0040】ここで、突条34は隣接する突条34に対して帯状部材30の長さ方向においてオーバーラップしており、その突条34は他方の帯状部材30に形成され

た突条34に対して逆向きに傾斜している。一对の突条34は、罫線刃23を対称線として左右対称に設けてもよく、罫線刃23の長さ方向に位置をずらして形成してもよい。

【0041】さらに、アンビル20には上記罫線刃23と対向する位置に合成樹脂から成る帯板35を、その背面に設けられた接着剤層36を介して取付け、上記帯板35の表面に、上記罫線刃23と対向して直線状の膨出条37を設けている。

【0042】上記罫入れ装置において、アンビル20上に段ボール紙1を供給して、そのアンビル20とダイブレード21を相対的に接近する方向に移動させることにより、段ボール紙1の表面側は罫線刃23と帯状部材30とで押し潰され、裏面側は膨出条37で押し潰され、図3に示す段ボール紙1が形成される。

【0043】図7(I)は、罫入れ装置のさらに他の実施の形態を示す。この罫入れ装置は、アンビルシリンダ40と、その上方に配置されたダイシリンダ41とを有し、上記ダイシリンダ41の外周に取付けられたダイボード42に合成樹脂から成る帯状の罫入れ部材43を接

着等の手段を介して取付けている。
【0044】罫入れ部材43には、図7(II)に示すように、幅方向の中央に罫入れ用の突刃44と、その突刃44の両側に押し潰し用の一对の段部45とが設けられ、各段部45の表面長さ方向に所要の間隔を置いて傾斜溝46が形成され、隣接する傾斜溝46間に突刃44に対して傾斜する突条47が設けられている。

【0045】突条47は隣接する突条47に対して段部45の長さ方向にオーバーラップしており、その突条47は他方の段部45に形成された突条47に対して逆向きに傾斜している。

【0046】上記の構成から成る罫入れ装置において、アンビルシリンダ40およびダイシリンダ41を矢印方向に回転し、その両シリンダ40、41間に段ボール紙1を送り込むことにより、段ボール紙1は罫入れされ、図1に示す段ボール紙1が形成される。

【0047】なお、図4、図6および図7に示す実施の形態において、実際にはダイボード22、42には打抜き刃が取付けられ、その打抜き刃によって段ボール紙1は所定の形状に打抜かれると同時に罫入れが施される。

【0048】

【発明の効果】以上のように、この発明においては、折曲げ基線部の両側に逆向きに傾斜する一对の補助線部を設けたことにより、折曲げ基線部を折れ筋として段ボール紙を折り曲げるとき、折曲げ応力は一对の補助線部と折曲げ基線部の交差部に集中し、上記折り曲げ基線に沿って精度よく折曲げることができる。

【0049】また、一对の補助線部の外端間の長さを段ボール紙の中芯に形成された山のピッチ以上としたことにより、折曲げ基線部の位置が中芯の隣接する山の2等

分位置よりずれがある場合でも、補助線部のそれぞれは折曲げ基線部の両側の山を完全に押し潰して強度を弱め、しかも、補助線部は隣接する補助線部に対して折曲げ基線の長さ方向にオーバーラップしているため、補助線部が入れた部分の強度は全長にわたって略均一化され、折曲げ基線部の両側部の強度の同一化を図ることができる。

【0050】このため、折曲げ基線部に沿う折曲げによって、その基線部の両側部分が互に干渉しても、両側部分の強度は略同一であるため、折れ筋にずれが生じることが少なく、折曲げ基線部に沿ってきわめて高精度に折曲げることができる。

【0051】さらに、ダイボードに取付けた罫線刃の両側に押し潰し部材を設け、各押し潰し部材に傾斜状の突条を設けたことにより、折曲げ基線部と、その両側に傾斜状の補助線部とから成る罫線を段ボール紙に対して簡単に形成することができる。

【0052】また、ダイシリンダに取付けられるダイボードに罫入れ部材を取付け、その罫入れ部材に設けた一对の段部表面に傾斜状の突条を設けたことにより、上記と同様に折曲げ基線部と補助線部とから成る罫線を段ボール紙に対して簡単に形成することができる。

【図面の簡単な説明】

【図1】この発明に係る罫線を施した段ボール紙の正面図

【図2】(I)は図1の拡大断面図、(II)は折曲げの途中を示す断面図、(III)は完全な折曲げ状態を示す断面図

【図3】逆罫線を施した段ボール紙の断面図

【図4】(I)はこの発明に係る罫入れ装置の実施の形態を示す断面図、(II)は罫入れ状態を示す断面図

【図5】(I)は同上のダイボードを示す斜視図、(II)は押し潰し部材を示す斜視図

【図6】(I)は罫入れ装置の他の実施の形態を示す断面図、(II)は(I)のダイボードの一部を示す斜視図

【図7】(I)は罫入れ装置のさらに他の実施の形態を示す断面図、(II)は押し潰し部材の斜視図

【図8】(I)、(II)、(III)に段ボール箱の形成過程を段階的に示す正面図

【図9】ブランクの断面図

【図10】(I)、(II)は不良の段ボール箱を示す正面図

【符号の説明】

11 折曲げ基線部

12a、12b 補助線部

20 アンビル

22 ダイボード

23 罫線刃

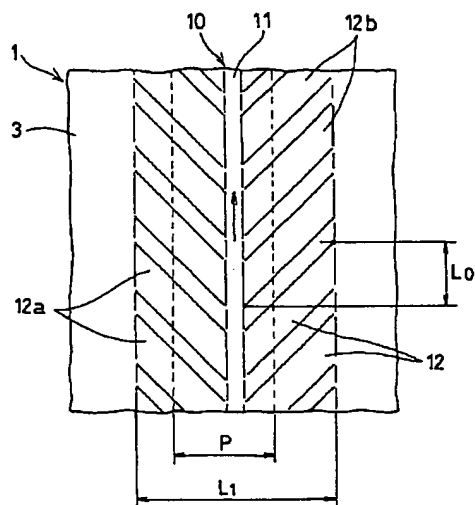
24a、24b 帯状部材

27 突条

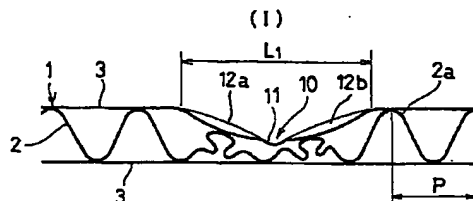
35 帯板
40 アンビルシリンダ
41 ダイシリンダ
42 ダイボード

* 43 鋸入れ部材
44 突刃
45 段部
* 47 突条

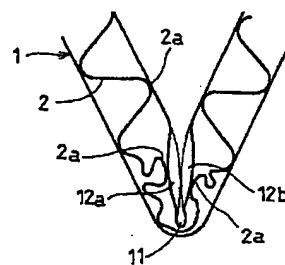
【図1】



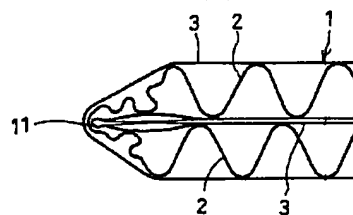
【図2】



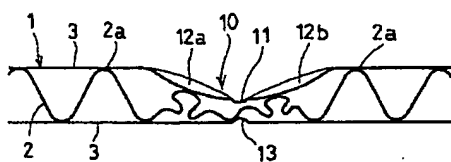
(II)



(III)

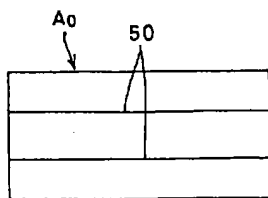


【図3】

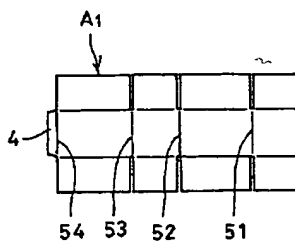


【図8】

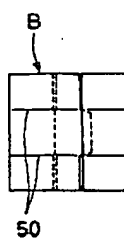
(I)



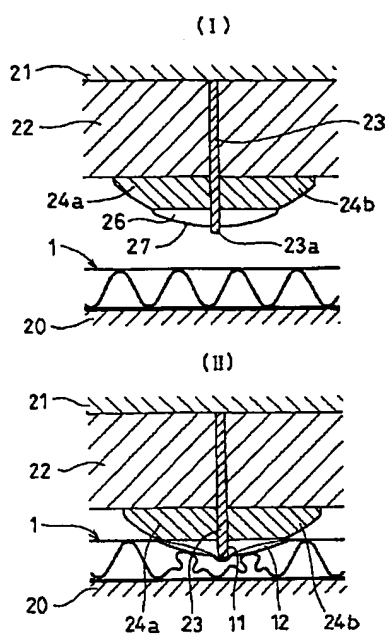
(II)



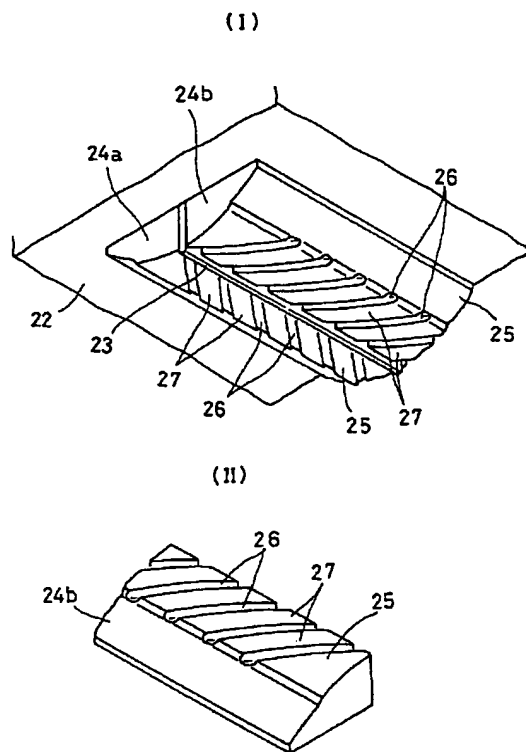
(III)



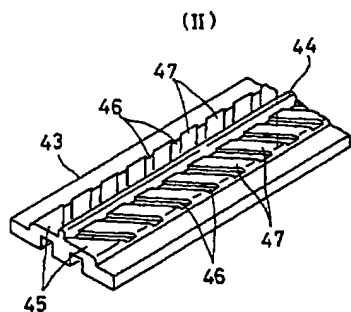
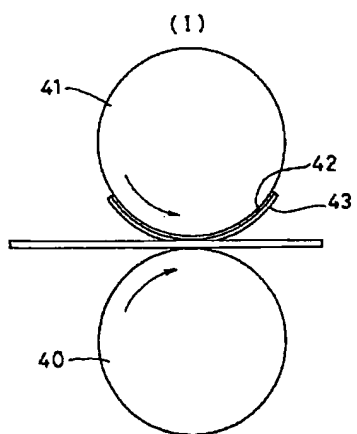
【図4】



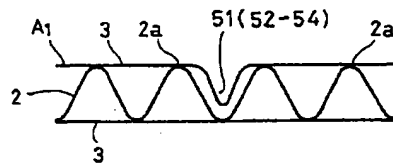
【図5】



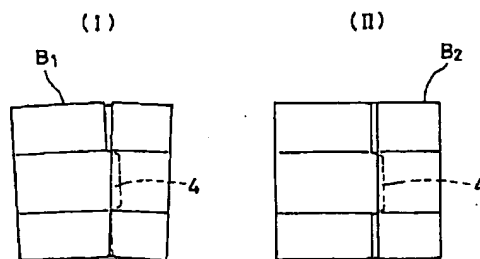
【図7】



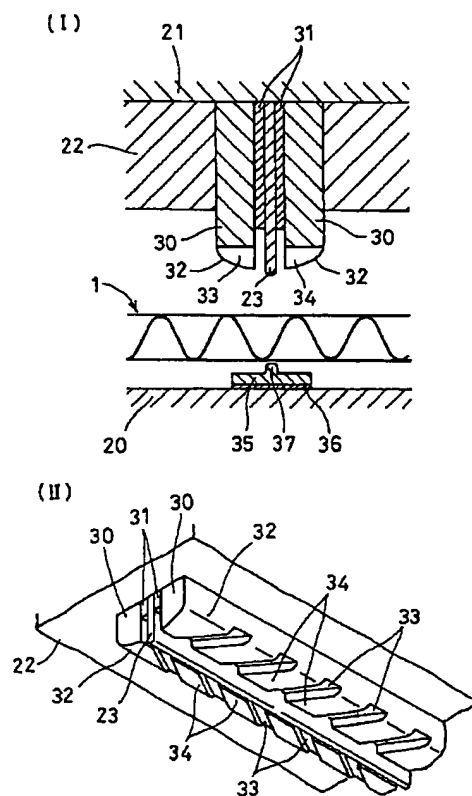
【図9】



【図10】



【図6】



【手続補正書】

【提出日】平成9年11月27日

【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】0010

【補正方法】変更

【補正内容】

【0010】

【発明が解決しようとする課題】ところで、本線部と隣接部とからなる野線においては、上記隣接部が本線部に対して直交し、本線部の長さ方向に所要の間隔をおいて設けられているため、隣接部での折曲げ強度と、隣接部間での折曲げ強度とに差が生じ、長さ方向の強度は不均一である。このため、本線部が中芯の隣接する山の2等分位置から左右にずれが生じている場合に、隣接部間の

強度は本線部の両側において異なり、フォルダグリアによって本線部を端から順に折曲げていく場合に、折曲げ位置が強度の弱い部分に移行していくことが考えられ、寸法精度の高い段ボール箱を形成するうえにおいて改善すべき点が残されている。

【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0020

【補正方法】変更

【補正内容】

【0020】

【発明の実施の形態】以下、この発明の実施の形態を図1乃至図7に基づいて説明する。

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : NIPPON DAISUCHI KK

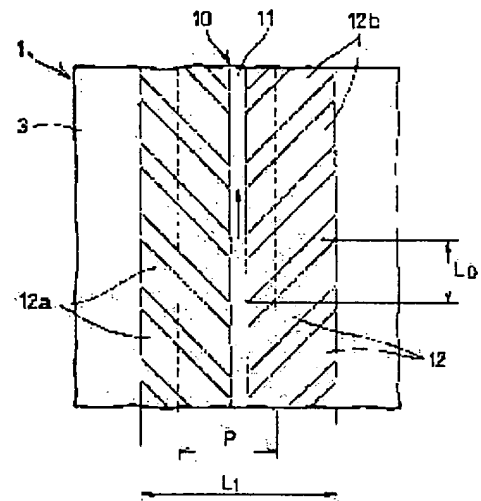
(22)Date of filing : 24.06.1997

(72)Inventor : TAKEUCHI TAKAYUKI

(54) FOLDING RULED LINE OF CORRUGATED FIBERBOARD SHEET AND DEVICE FOR FORMING RULED LINE**(57)Abstract:**

PROBLEM TO BE SOLVED: To provide ruled lines capable of being folded with high accuracy.

SOLUTION: A straight folding base line 11 is formed by crushing from faces to be in sides during folding. Auxiliary lines 12a, 12b are formed by crushing at both sides of the folding base line 11 in the longitudinal direction of the folding base line 11 at predetermined distances, and the auxiliary lines 12a, 12b at both sides of the folding base line 11 are inclined in an inverted manner, and further strength at both sides of the folding base line 11 is weakened through the auxiliary lines 12a, 12b, thereby facilitating folding operation and raising folding accuracy along the folding base line 11.

**LEGAL STATUS**

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 CLAIMS

[Claim(s)]

[Claim 1] from the field which serves as the inside at the time of folding of a corrugated board -- crushing -- from the folding baseline section of the shape of a formed straight line, and the field which serves as the inside at the time of folding -- crushing -- the ruled line of the corrugated board which it consisted [corrugated board] of the auxiliary line section of the pair of the letter of an inclination which set necessary spacing and was established along with the both sides of the above-mentioned folding baseline section, and made the auxiliary line section of the both sides of the above-mentioned folding baseline section incline in the reverse sense for folding.

[Claim 2] The ruled line for folding of the corrugated board according to claim 1 which carried out the length between the outer edges of the auxiliary line section prepared in the both sides of said folding baseline section to more than the pitch of the crest in the wavelike green sand core of a corrugated board.

[Claim 3] The ruled line for folding of the corrugated board according to claim 1 or 2 which made said auxiliary line section overlap in the die-length direction of said folding baseline section to the adjoining auxiliary line section.

[Claim 4] On the die board relatively moved to plate-like Annville, a straight-line-like ruled line cutting edge, Attach the band-like member prolonged for a long time along with the both sides of the ruled line cutting edge, and above-mentioned Annville and a die board are moved relatively. In the ***** equipment of the corrugated board which crushed the both sides of the ***** by the above-mentioned band-like member, ***** (ing) the corrugated board supplied among both members with the above-mentioned ruled line cutting edge ***** equipment of the corrugated board characterized by making the above-mentioned protruding line which set necessary spacing in the die-length direction of a band-like member, prepared it, and was formed in the band-like member of a pair in the protruding line which inclines to said ruled line cutting edge in the front-face side of said band-like member incline in the reverse sense at **.

[Claim 5] ***** equipment of the corrugated board according to claim 4 characterized by said band-like member consisting of an elastic body.

[Claim 6] ***** equipment of the corrugated board according to claim 4 or 5 characterized by attaching in said Annville the strip which has ***** of the shape of a straight line for reverse ***** on a front face so that the ***** may counter with said ruled line cutting edge.

[Claim 7] **** for ***** prolonged in the hoop direction of a die board in the band-like ***** member which attached the cylinder-like die board in the die cylinder which countered the Annville cylinder and was prepared, and was attached in the die board, Crush on the both sides, prepare the step of the pair of business, and inverse rotation of above-mentioned Annville and the die cylinder is carried out. In the ***** equipment which crushed the both-sides section by the step while ***** (ing) the corrugated board sent in between them by the above-mentioned ***** ***** equipment of the corrugated board characterized by having set the protruding line which inclines to said **** in the step front-face side of the pair in said ***** member in the die-length direction of a ***** member, having prepared necessary spacing, and making the protruding line in the step of a pair incline in the reverse sense.

[Claim 8] ***** equipment of the corrugated board according to claim 4 to 7 characterized by carrying out die length between the outer edges of the protruding line of said pair to more than the pitch of the crest formed in the green sand core of a corrugated board.

[Claim 9] ***** equipment of the corrugated board according to claim 4 to 8 characterized by making said protruding line overlap to an adjoining protruding line.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ruled line and ***** equipment into which it is put in the folding location of a corrugated board.

[0002]

[Description of the Prior Art] blank A1 which generally shows a carton box to drawing 8 (II) from — it is formed of folding. blank A1 Rectangle corrugated board A0 which has the horizontal ruled line 50 of two articles of parallel as shown in drawing 8 (I) from — it is formed of blanking. Two or more vertical ruled lines 51, 52, 53, and 54 are formed in the blanking and coincidence, and each vertical ruled lines 51, 52, 53, and 54 are corrugated boards A0. It has extended in the die-length direction of the crest of the green sand core 2 of the shape of a wave to form.

[0003] Blank A1 Folder gluer is supplied and the vertical ruled lines 51 and 53 are usually bent by the folder gluer. Moreover, blank A1 The prepared joint flap 4 minds the applied adhesives, and is a blank A1. An edge is pasted. Of that adhesion, flat carton box B as shown in drawing 8 (III) is formed, and this carton box B is assembled in three dimensions by folding from the horizontal ruled line 50.

[0004] In order to manufacture carton box B with high dimensional accuracy, it is a blank A1. It is necessary to bend with a sufficient precision along with the formed vertical ruled lines 51, 52, 53, and 54.

[0005] Here, since the configuration on either side where they will sandwich the vertical ruled line if the vertical ruled lines 51, 52, 53, and 54 are formed in 2 division-into-equal-parts location between adjoining crest 2a in the green sand core 2 of a blank A1 as shown in drawing 9 is a symmetry form, the reinforcement of a right-and-left part can be bent with a comparatively sufficient precision along with the above-mentioned vertical ruled lines 51, 52, 53, and 54 which spread abbreviation etc.

[0006] By the way, the formation location of the vertical ruled lines 51, 52, 53, and 54 is established in the location which is very rare as for being prepared in 2 division-into-equal-parts location of the crest where green sand core 2a adjoins, and inclined toward right and left from the 2 division-into-equal-parts location in many cases. In this case, since the configuration in the right-and-left part which makes a symmetry line the vertical ruled lines 51, 52, 53, and 54 becomes unsymmetrical, the reinforcement in a right-and-left part is different. for this reason, as deviation arises in the one where reinforcement is weaker, and that folding location cannot be bent with a sufficient precision a bending wooden-clogs case but a corrugated board is shown in drawing 10 (I) along with the vertical ruled lines 51 and 53 Carton box B1 from which an up-and-down width-of-face dimension is different Carton box B-2 which has excess and deficiency in the paste allowance of the joint flap 4 as it is formed or is shown in drawing 10 (II) It is formed and a carton box with high dimensional accuracy cannot be formed.

[0007] Corrugated board A0 As ***** equipment into which a vertical ruled line is put, a band-like member is prepared along with the both sides of a ruled line cutting edge, and what crushed the both-sides part of ***** by the above-mentioned band-like member at the time of ***** by pushing of the above-mentioned ruled line cutting edge is known from the former.

[0008] However, in the above-mentioned ***** equipment, since a corrugated board is pushed in on the whole front face where a band-like member is flat, the both-sides part of a ***** location with a ruled line cutting edge cannot be crushed completely, also in this case, the reinforcement of the both-sides section of ***** is different, and a carton box with high dimensional accuracy cannot be formed.

[0009] from the field which forms the ruled line formed in a corrugated board in the main track section and the contiguity section in which it was prepared along with the main track section, bends each of the above-mentioned main track section and the contiguity section, and sometimes becomes with the inside in invention indicated by JP,9-70905,A in order to solve the above troubles -- crushing -- it forms.

[0010]

[Problem(s) to be Solved by the Invention] By the way, since the above-mentioned contiguity section intersects perpendicularly from the main track section and the contiguity section to the main track section in a ruled line, and necessary spacing is set in the die-length direction of the main track section and it is prepared in it, a difference arises about the folding reinforcement in the contiguity section, and the folding reinforcement between the contiguity sections, and the reinforcement of the die-length direction is uneven. for this reason, when the gap have arise from 2 division into equal parts location of the crest where a green sand core adjoin [the main track section] right and left, the reinforcement between the contiguity sections differ in the both sides of the main track section, and when bend the main track section sequentially from the edge by folder gluer, the point which can consider that a folding location shift to a part with weak reinforcement, and form a carton box with high dimensional accuracy, and also should be improve be leave behind.

[0011] The technical problem of this invention is offering the ruled line and ***** equipment which can be bent very with high precision.

[0012]

[Means for Solving the Problem] In the ruled line which starts this invention in order to solve the above-mentioned technical problem from the field which serves as the inside at the time of folding of a corrugated board -- crushing -- with the folding baseline section of the shape of a formed straight line from the field which serves as the inside at the time of folding -- crushing -- it consisted of the auxiliary line section of the pair of the letter of an inclination which set necessary spacing and was established along with the both sides of the above-mentioned folding baseline section, and the configuration which made the auxiliary line section of the both sides of the above-mentioned folding baseline section incline in the reverse sense is adopted.

[0013] Here, the crest of the green sand core located in the both sides of the folding baseline section is certainly crushed by the above-mentioned auxiliary line section as more than the pitch of a crest [in / in the die length between the outer edges of the auxiliary line section prepared in the both sides of the folding baseline section / the wavelike green sand core of a corrugated board].

[0014] When the folding baseline section is preferably prepared in the crowning of a crest, and a corresponding location more than as twice of the pitch of the above-mentioned crest, as for the die length between the outer edges of the above-mentioned auxiliary line section, it is desirable that the crest of the both sides is crushed in the auxiliary line section.

[0015] Moreover, the auxiliary line section is good to make the adjoining auxiliary line section overlap, to bend by the auxiliary line section, and for the both-sides section of the baseline section to be crushed by abbreviation homogeneity covering an overall length.

[0016] In the ***** equipment concerning this invention, on the die board relatively moved to plate-like Annville, a straight-line-like ruled line cutting edge, Attach the band-like member prolonged for a long time along with the both sides of the ruled line cutting edge, and above-mentioned Annville and a die board are moved relatively. In the ***** equipment of the corrugated board which crushed the both sides of the ***** by the above-mentioned band-like member, ***** (ing) the corrugated board supplied among both members with the above-mentioned ruled line cutting edge The configuration which made the above-mentioned protruding line which set necessary spacing in the die-length direction of a band-like member, prepared it,

and was formed in the band-like member of a pair in the protruding line which inclines to said ruled line cutting edge in the front-face side of said band-like member incline in the reverse sense at ** is adopted.

[0017] The above-mentioned band-like member may have the elasticity which consists of a cork, synthetic rubber, or its mixture.

[0018] Moreover, the strip which has ***** of the shape of a straight line for reverse ***** on a front face may be attached in said Annville so that the ***** may counter with said ruled line cutting edge.

[0019] Furthermore, it sets to the ***** equipment concerning this invention. ***** for ***** prolonged in the hoop direction of a die board in the band-like ***** member which attached the cylinder-like die board in the die cylinder which countered the Annville cylinder and was prepared, and was attached in the die board, Crush on the both sides, prepare the step of the pair of business, and inverse rotation of above-mentioned Annville and the die cylinder is carried out. In the ***** equipment which crushed the both-sides section by the step while ***** (ing) the corrugated board sent in between them by the above-mentioned ***** The protruding line which inclines to said ***** in the step front-face side of the pair in said ***** member was set in the die-length direction of a ***** member, necessary spacing was prepared, and the configuration which made the protruding line in the step of a pair incline in the reverse sense is adopted.

[0020]

[Embodiment of the Invention] In the above, the gestalt of implementation of this invention is explained based on drawing 1 thru/or drawing 7.

[0021] As shown in drawing 1 and drawing 2, a corrugated board 1 consists of the wave-like green sand core 2 and the liner 3 pasted up on the front flesh side, it bends to the corrugated board 1, and the ruled line 10 of business is formed.

[0022] A ruled line 10 consists of the folding baseline section 11 and the auxiliary line sections 12a and 12b of the pair which set necessary spacing and was prepared along with the both sides. from the field where the folding baseline section 11 and the auxiliary line section 12 serve as the inside at the time of folding -- crushing -- it has extended in the die-length direction of crest 2a in which it was formed and the above-mentioned folding baseline section 11 was formed in the green sand core 2.

[0023] The auxiliary line sections 12a and 12b incline to the above-mentioned folding baseline section 11, and the auxiliary line sections 12a and 12b of a pair incline in the reverse sense at **. Moreover, the auxiliary line sections 12a and 12b are overlapped to the adjoining auxiliary line section. L0 The amount of overlap is shown.

[0024] Die length L1 between the outer edges of the auxiliary line sections 12a and 12b of a pair It is carried out to more than the pitch P of crest 2a of a green sand core 2. For this reason, even when having shifted from 2 grade location of crest 2a where the folding baseline section 11 adjoins, crest 2a which it bends by the auxiliary line sections 12a and 12b of a pair, and the baseline section 11 adjoins is crushed. Here, the depth of the auxiliary line sections 12a and 12b may be the same depth as the folding baseline section 11, and may be shallower than it. Moreover, the auxiliary line sections 12a and 12b of a pair are bent like illustration, may be prepared in bilateral symmetry by making the baseline section 11 into a symmetry line, may bend left-hand side auxiliary line section 12a and right-hand side auxiliary line section 12b, and may shift and form a location in the die-length direction of the baseline section 11.

[0025] The pitch and tilt angle of the width-of-face dimension and the depth of the folding baseline section 11 and the auxiliary line sections 12a and 12b, and the auxiliary line sections 12a and 12b are suitably determined according to the class of corrugated board 1.

[0026] The auxiliary line sections 12a and 12b which incline in the reverse sense relatively along with the both sides of the folding baseline section 11 as mentioned above, by having set and prepared necessary spacing Since the reinforcement of the folding baseline section 11 is weaker than the reinforcement in the formation part of the auxiliary line sections 12a and 12b, by bending a corrugated board 1 and bending along with the baseline section 11, a corrugated board 1 breaks the above-mentioned folding baseline section 11, and is bent as a muscle.

[0027] If folding of a corrugated board 1 progresses, as shown in drawing 2 (II), the both-sides section of the folding baseline section 11 will begin to interfere in **.

[0028] At this time, crest 2a of the green sand core 2 in the both-sides section of the folding baseline section 11 It is crushed by the auxiliary line sections 12a and 12b, and are weak in reinforcement. The auxiliary line sections 12a and 12b since it bends to the adjoining auxiliary line sections 12a and 12b and overlaps in the die-length direction of the baseline section 11 — the reinforcement of the both-sides section of the folding baseline section 11 — the die-length direction — setting — abbreviation equalization — carrying out — and the reinforcement of the both-sides section — abbreviation — it considers as the same magnitude.

[0029] for this reason — while it is easily bendable since the reinforcement of that buffer section is weak even if folding progresses and the both-sides section of the folding baseline section 11 begins to buffer in ** — the reinforcement of the both-sides buffer section — abbreviation — since it is the same, as it can prevent that a gap arises in crease sources and it is shown in drawing 2 (III), along with the folding baseline 11, it can bend very with high precision.

[0030] Supplying the above-mentioned corrugated board 1 to folder gluer, and making the corrugated board 1 transport in the direction of an arrow head of drawing 1 Since the auxiliary line sections 12a and 12b of a pair incline in the opposite direction when bending the folding baseline section 11 sequentially from the tip of the migration direction, The stress at the time of folding is bent with the auxiliary line sections 12a and 12b, and it can concentrate on the intersection of the baseline section 11, and it can be bent very with high precision along with the above-mentioned folding baseline section 11.

[0031] If it bends to the field which serves as an outside at the time of folding of a corrugated board 1, the baseline section 11 is countered and the reverse ruled line 13 is formed as shown in drawing 3 , it bends with the reverse ruled line 13, and since the reinforcement between the baseline sections 11 becomes still weaker, it is more bendable to high degree of accuracy along with the above-mentioned folding baseline section 11.

[0032] Drawing 4 (I) shows the gestalt of operation of ***** equipment. This ***** equipment has the die plate 21 by which opposite arrangement was carried out in plate-like Annville 20 and its Annville 20, and Annville 20 and a die plate 21 are moved relatively.

[0033] The die board 22 is attached in the inferior surface of tongue of a die plate 21, and the band-like ruled line cutting edge 23 is planted in the die board 22.

[0034] As for edge-of-a-blade section 23a of the ruled line cutting edge 23, along with the both sides of a projection and its lobe, the band-like members 24a and 24b are caudad attached from the inferior surface of tongue of the die board 22.

[0035] As shown in drawing 5 (I) and (II), the band-like members 24a and 24b consist of an elastic body made from the mixture of rubber, a cork, or its both etc., and let the front face be an inclined plane 25. In an inclined plane 25, necessary spacing is set in the die-length direction, the inclination slot 26 is formed, and the protruding line 27 of the letter of an inclination is formed between the adjoining inclination slots 26.

[0036] The protruding line 27 overlaps in the adjoining die-length direction of a protruding line 27 and the band-like members 24a and 24b. Moreover, the protruding line 27 inclines in the reverse sense to the protruding line 27 formed in the band-like member of another side. Here, the protruding line 27 of the both sides of the ruled line cutting edge 23 may be formed in bilateral symmetry by making the above-mentioned ruled line cutting edge 23 into a symmetry line, and may shift and form a location in the die-length direction of the ruled line cutting edge 23.

[0037] In the condition of having supplied the corrugated board 1 on Annville 20 now, by moving the Annville 20 and die plate 21 in the direction approached relatively, as shown in drawing 4 (II), a corrugated board 1 is crushed with the ruled line cutting edge 23, and is ***** (ed) in the shape of a muscle. Moreover, while the both sides of ***** are crushed by the band-like members 24a and 24b, the letter of an inclination crushes by the protruding line 27, and it is put into a slot, and as shown in drawing 4 (II), the folding baseline section 11 and the auxiliary ruled line sections 12a and 12b are formed.

[0038] Drawing 6 (I) shows other examples of ***** equipment. This ***** equipment plants

the ruled line cutting edge 23 and the band-like members 30 and 30 of the pair which consists of a metal in the die board 22 attached in the die plate 21, and is pressing the spacer 31 fit between each push crushing members 30 and 30 and the ruled line cutting edge 23.

[0039] Moreover, as shown in drawing 6 (II), the circular end face 32 was formed in the band-like member 30, necessary spacing was set in the die-length direction of the circular end face 32, the inclination slot 33 was formed in it, and the protruding line 34 of the letter of an inclination is provided between the adjoining inclination slots 33.

[0040] Here, the protruding line 34 is overlapped in the die-length direction of the band-like member 30 to the adjoining protruding line 34, and the protruding line 34 inclines in the reverse sense to the protruding line 34 formed in the band-like member 30 of another side. The protruding line 34 of a pair may be formed in bilateral symmetry by making the ruled line cutting edge 23 into a symmetry line, and may shift and form a location in the die-length direction of the ruled line cutting edge 23.

[0041] Furthermore, the above-mentioned ruled line cutting edge 23 and the strip 35 which changes from synthetic resin to the location which counters were attached in Annville 20 through the adhesives layer 36 in which it was prepared at the tooth back, the front face of the above-mentioned strip 35 was countered with the above-mentioned ruled line cutting edge 23, and straight-line-like ***** 37 is formed in it.

[0042] In the above-mentioned ***** equipment, by supplying a corrugated board 1 on Annville 20, and moving the Annville 20 and die plate 21 in the direction approached relatively, the front-face side of a corrugated board 1 is crushed by the ruled line cutting edge 23 and the band-like member 30, a rear-face side is crushed by ***** 37, and the corrugated board 1 shown in drawing 3 is formed.

[0043] Drawing 7 (I) shows the gestalt of the operation of further others of ***** equipment. This ***** equipment had the Annville cylinder 40 and the die cylinder 41 arranged in that upper part, and has attached the band-like ***** member 43 which changes from synthetic resin to the die board 42 attached in the periphery of the above-mentioned die cylinder 41 through means, such as adhesion.

[0044] As shown in drawing 7 (II), it crushes on both sides of ***** 44 for ***** , and its ***** 44, and the step 45 of the pair of business is formed in the crosswise center, necessary spacing is set in the surface die-length direction of each step 45, the inclination slot 46 is formed in it, and the protruding line 47 which inclines to ***** 44 between the adjoining inclination slots 46 is formed in the ***** member 43.

[0045] The protruding line 47 overlaps in the die-length direction of a step 45 to the adjoining protruding line 47, and the protruding line 47 inclines in the reverse sense to the protruding line 47 formed in the step 45 of another side.

[0046] In the ***** equipment which consists of the above-mentioned configuration, by rotating the Annville cylinder 40 and the die cylinder 41 in the direction of an arrow head, and sending in a corrugated board 1 between both the cylinder 40 and 41, a corrugated board 1 is ***** (ed) and the corrugated board 1 shown in drawing 1 is formed.

[0047] In addition, in the gestalt of operation shown in drawing 4 , drawing 6 , and drawing 7 , ***** is given at the same time it pierces on the die boards 22 and 42 in fact, and a cutting edge is attached and a corrugated board 1 is pierced by the predetermined configuration with the blanking cutting edge.

[0048]

[Effect of the Invention] As mentioned above, in this invention, when breaking the folding baseline section and bending a corrugated board as a muscle by having prepared the auxiliary line section of the pair which inclines in the reverse sense at the both sides of the folding baseline section, folding stress is bent with the auxiliary line section of a pair, and it can concentrate on the intersection of the baseline section and it can be bent with a sufficient precision along with the above-mentioned bending baseline.

[0049] Moreover, by having carried out die length between the outer edges of the auxiliary line section of a pair to more than the pitch of the crest formed in the green sand core of a corrugated board Even when there is a gap from 2 division-into-equal-parts location of the crest

where a green sand core adjoins [the location of the folding baseline section] Since each of the auxiliary line section crushes the crest of the both sides of the folding baseline section completely, and weakens reinforcement, the auxiliary line section is moreover bent to the adjoining auxiliary line section and it overlaps in the die-length direction of a baseline, Abbreviation equalization is carried out covering an overall length, and the reinforcement of the part which the auxiliary line section put in can attain identification of the reinforcement of the both-sides section of the folding baseline section.

[0050] For this reason, by folding in alignment with the folding baseline section, even if the both-sides part of that baseline section interferes in **, since the reinforcement of a both-sides part is abbreviation identitas, it is rare for a gap to arise in crease sources, and it can bend it very with high precision along with the folding baseline section.

[0051] Furthermore, the ruled line which consists of the auxiliary line section of the letter of an inclination can be easily formed in the both sides to a corrugated board with the folding baseline section by having crushed on both sides of the ruled line cutting edge attached in the die board, having prepared the member, and having prepared the protruding line of the letter of an inclination in each push crushing member.

[0052] Moreover, the ruled line which bends like the above and consists of the baseline section and the auxiliary line section can be easily formed to a corrugated board by having attached the ***** member in the die board attached in a die cylinder, and having prepared the protruding line of the letter of an inclination in the step front face of a pair established in the ***** member.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the ruled line and ***** equipment into which it is put in the folding location of a corrugated board.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] blank A1 which generally shows a carton box to drawing 8 (II) from — it is formed of folding. blank A1 Rectangle corrugated board A0 which has the horizontal ruled line 50 of two articles of parallel as shown in drawing 8 (I) from — it is formed of blanking. Two or more vertical ruled lines 51, 52, 53, and 54 are formed in the blanking and coincidence, and each vertical ruled lines 51, 52, 53, and 54 are corrugated boards A0. It has extended in the die-length direction of the crest of the green sand core 2 of the shape of a wave to form.

[0003] Blank A1 Folder gluer is supplied and the vertical ruled lines 51 and 53 are usually bent by the folder gluer. Moreover, blank A1 The prepared joint flap 4 minds the applied adhesives, and is a blank A1. An edge is pasted. Of that adhesion, flat carton box B as shown in drawing 8 (III) is formed, and this carton box B is assembled in three dimensions by folding from the horizontal ruled line 50.

[0004] In order to manufacture carton box B with high dimensional accuracy, it is a blank A1. It is necessary to bend with a sufficient precision along with the formed vertical ruled lines 51, 52, 53, and 54.

[0005] Here, since the configuration on either side where they will sandwich the vertical ruled line if the vertical ruled lines 51, 52, 53, and 54 are formed in 2 division-into-equal-parts location between adjoining crest 2a in the green sand core 2 of a blank A1 as shown in drawing 9 is a symmetry form, the reinforcement of a right-and-left part can be bent with a comparatively sufficient precision along with the above-mentioned vertical ruled lines 51, 52, 53, and 54 which spread abbreviation etc.

[0006] By the way, the formation location of the vertical ruled lines 51, 52, 53, and 54 is established in the location which is very rare as for being prepared in 2 division-into-equal-parts location of the crest where green sand core 2a adjoins, and inclined toward right and left from the 2 division-into-equal-parts location in many cases. In this case, since the configuration in the right-and-left part which makes a symmetry line the vertical ruled lines 51, 52, 53, and 54 becomes unsymmetrical, the reinforcement in a right-and-left part is different. for this reason, as deviation arises in the one where reinforcement is weaker, and that folding location cannot be bent with a sufficient precision a bending wooden-clogs case but a corrugated board is shown in drawing 10 (I) along with the vertical ruled lines 51 and 53 Carton box B1 from which an up-and-down width-of-face dimension is different Carton box B-2 which has excess and deficiency in the paste allowance of the joint flap 4 as it is formed or is shown in drawing 10 (II) It is formed and a carton box with high dimensional accuracy cannot be formed.

[0007] Corrugated board A0 As ***** equipment into which a vertical ruled line is put, a band-like member is prepared along with the both sides of a ruled line cutting edge, and what crushed the both-sides part of ***** by the above-mentioned band-like member at the time of ***** by pushing of the above-mentioned ruled line cutting edge is known from the former.

[0008] However, in the above-mentioned ***** equipment, since a corrugated board is pushed in on the whole front face where a band-like member is flat, the both-sides part of a ***** location with a ruled line cutting edge cannot be crushed completely, also in this case, the reinforcement of the both-sides section of ***** is different, and a carton box with high dimensional accuracy cannot be formed.

[0009] from the field which forms the ruled line formed in a corrugated board in the main track section and the contiguity section in which it was prepared along with the main track section, bends each of the above-mentioned main track section and the contiguity section, and sometimes becomes with the inside in invention indicated by JP,9-70905,A in order to solve the above troubles — crushing — it forms.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, in this invention, when breaking the folding baseline section and bending a corrugated board as a muscle by having prepared the auxiliary line section of the pair which inclines in the reverse sense at the both sides of the folding baseline section, folding stress is bent with the auxiliary line section of a pair, and it can concentrate on the intersection of the baseline section and it can be bent with a sufficient precision along with the above-mentioned bending baseline.

[0049] Moreover, the thing done for the die length between the outer edges of the auxiliary line section of a pair to more than the pitch of the crest formed in the green sand core of a corrugated board, Even when there is a gap from 2 division-into-equal-parts location of the crest where a green sand core adjoins [the location of the folding baseline section] Since each of the auxiliary line section crushes the crest of the both sides of the folding baseline section completely, and weakens reinforcement, the auxiliary line section is moreover bent to the adjoining auxiliary line section and it overlaps in the die-length direction of a baseline, Abbreviation equalization is carried out covering an overall length, and the reinforcement of the part which the auxiliary line section put in can attain identification of the reinforcement of the both-sides section of the folding baseline section.

[0050] For this reason, by folding in alignment with the folding baseline section, even if the both-sides part of that baseline section interferes in **, since the reinforcement of a both-sides part is abbreviation identitas, it is rare for a gap to arise in crease sources, and it can bend it very with high precision along with the folding baseline section.

[0051] Furthermore, the ruled line which consists of the auxiliary line section of the letter of an inclination can be easily formed in the both sides to a corrugated board with the folding baseline section by having crushed on both sides of the ruled line cutting edge attached in the die board, having prepared the member, and having prepared the protruding line of the letter of an inclination in each push crushing member.

[0052] Moreover, the ruled line which bends like the above and consists of the baseline section and the auxiliary line section can be easily formed to a corrugated board by having attached the ***** member in the die board attached in a die cylinder, and having prepared the protruding line of the letter of an inclination in the step front face of a pair established in the ***** member.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, since the above-mentioned contiguity section intersects perpendicularly from the main track section and the contiguity section to the main track section in a ruled line, and necessary spacing is set in the die-length direction of the main track section and it is prepared in it, a difference arises about the folding reinforcement in the contiguity section, and the folding reinforcement between the contiguity sections, and the reinforcement of the die-length direction is uneven. for this reason , when the gap have arise from 2 division into equal parts location of the crest where a green sand core adjoin [the main track section] right and left , the reinforcement between the contiguity sections differ in the both sides of the main track section , and when bend the main track section sequentially from the edge by folder gluer , the point which can consider that a folding location shift to a part with weak reinforcement , and form a carton box with high dimensional accuracy , and also should be improve be leave behind .

[0011] The technical problem of this invention is offering the ruled line and ***** equipment which can be bent very with high precision.

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MEANS

[Means for Solving the Problem] In the ruled line which starts this invention in order to solve the above-mentioned technical problem from the field which serves as the inside at the time of folding of a corrugated board — crushing — with the folding baseline section of the shape of a formed straight line from the field which serves as the inside at the time of folding — crushing — it consisted of the auxiliary line section of the pair of the letter of an inclination which set necessary spacing and was established along with the both sides of the above-mentioned folding baseline section, and the configuration which made the auxiliary line section of the both sides of the above-mentioned folding baseline section incline in the reverse sense is adopted.

[0013] Here, the crest of the green sand core located in the both sides of the folding baseline section is certainly crushed by the above-mentioned auxiliary line section as more than the pitch of a crest [in / in the die length between the outer edges of the auxiliary line section prepared in the both sides of the folding baseline section / the wavelike green sand core of a corrugated board].

[0014] When the folding baseline section is preferably prepared in the crowning of a crest, and a corresponding location more than as twice of the pitch of the above-mentioned crest, as for the die length between the outer edges of the above-mentioned auxiliary line section, it is desirable that the crest of the both sides is crushed in the auxiliary line section.

[0015] Moreover, the auxiliary line section is good to make the adjoining auxiliary line section overlap, to bend by the auxiliary line section, and for the both-sides section of the baseline section to be crushed by abbreviation homogeneity covering an overall length.

[0016] In the ***** equipment concerning this invention, on the die board relatively moved to plate-like Annville, a straight-line-like ruled line cutting edge, Attach the band-like member prolonged for a long time along with the both sides of the ruled line cutting edge, and above-mentioned Annville and a die board are moved relatively. In the ***** equipment of the corrugated board which crushed the both sides of the ***** by the above-mentioned band-like member, ***** (ing) the corrugated board supplied among both members with the above-mentioned ruled line cutting edge The configuration which made the above-mentioned protruding line which set necessary spacing in the die-length direction of a band-like member, prepared it, and was formed in the band-like member of a pair in the protruding line which inclines to said ruled line cutting edge in the front-face side of said band-like member incline in the reverse sense at ** is adopted.

[0017] The above-mentioned band-like member may have the elasticity which consists of a cork, synthetic rubber, or its mixture.

[0018] Moreover, the strip which has ***** of the shape of a straight line for reverse ***** on a front face may be attached in said Annville so that the ***** may counter with said ruled line cutting edge.

[0019] Furthermore, it sets to the ***** equipment concerning this invention. **** for ***** prolonged in the hoop direction of a die board in the band-like ***** member which attached the cylinder-like die board in the die cylinder which countered the Annville cylinder and was prepared, and was attached in the die board, Crush on the both sides, prepare the step of the pair of business, and inverse rotation of above-mentioned Annville and the die cylinder is carried

out. In the ***** equipment which crushed the both-sides section by the step while ***** (ing) the corrugated board sent in between them by the above-mentioned *****. The protruding line which inclines to said ***** in the step front-face side of the pair in said ***** member was set in the die-length direction of a ***** member, necessary spacing was prepared, and the configuration which made the protruding line in the step of a pair incline in the reverse sense is adopted.

[0020]

[Embodiment of the Invention] In the above, the gestalt of implementation of this invention is explained based on drawing 1 thru/or drawing 7.

[0021] As shown in drawing 1 and drawing 2, a corrugated board 1 consists of the wave-like green sand core 2 and the liner 3 pasted up on the front flesh side, it bends to the corrugated board 1, and the ruled line 10 of business is formed.

[0022] A ruled line 10 consists of the folding baseline section 11 and the auxiliary line sections 12a and 12b of the pair which set necessary spacing and was prepared along with the both sides. from the field where the folding baseline section 11 and the auxiliary line section 12 serve as the inside at the time of folding -- crushing -- it has extended in the die-length direction of crest 2a in which it was formed and the above-mentioned folding baseline section 11 was formed in the green sand core 2.

[0023] The auxiliary line sections 12a and 12b incline to the above-mentioned folding baseline section 11, and the auxiliary line sections 12a and 12b of a pair incline in the reverse sense at **. Moreover, the auxiliary line sections 12a and 12b are overlapped to the adjoining auxiliary line section. L0 The amount of overlap is shown.

[0024] Die length L1 between the outer edges of the auxiliary line sections 12a and 12b of a pair It is carried out to more than the pitch P of crest 2a of a green sand core 2. For this reason, even when having shifted from 2 grade location of crest 2a where the folding baseline section 11 adjoins, crest 2a which it bends by the auxiliary line sections 12a and 12b of a pair, and the baseline section 11 adjoins is crushed. Here, the depth of the auxiliary line sections 12a and 12b may be the same depth as the folding baseline section 11, and may be shallower than it. Moreover, the auxiliary line sections 12a and 12b of a pair are bent like illustration, may be prepared in bilateral symmetry by making the baseline section 11 into a symmetry line, may bend left-hand side auxiliary line section 12a and right-hand side auxiliary line section 12b, and may shift and form a location in the die-length direction of the baseline section 11.

[0025] The pitch and tilt angle of the width-of-face dimension and the depth of the folding baseline section 11 and the auxiliary line sections 12a and 12b, and the auxiliary line sections 12a and 12b are suitably determined according to the class of corrugated board 1.

[0026] The auxiliary line sections 12a and 12b which incline in the reverse sense relatively along with the both sides of the folding baseline section 11 as mentioned above, by having set and prepared necessary spacing Since the reinforcement of the folding baseline section 11 is weaker than the reinforcement in the formation part of the auxiliary line sections 12a and 12b, by bending a corrugated board 1 and bending along with the baseline section 11, a corrugated board 1 breaks the above-mentioned folding baseline section 11, and is bent as a muscle.

[0027] If folding of a corrugated board 1 progresses, as shown in drawing 2 (II), the both-sides section of the folding baseline section 11 will begin to interfere in **.

[0028] At this time, crest 2a of the green sand core 2 in the both-sides section of the folding baseline section 11 It is crushed by the auxiliary line sections 12a and 12b, and are weak in reinforcement. The auxiliary line sections 12a and 12b since it bends to the adjoining auxiliary line sections 12a and 12b and overlaps in the die-length direction of the baseline section 11 -- the reinforcement of the both-sides section of the folding baseline section 11 -- the die-length direction -- setting -- abbreviation equalization -- carrying out -- and the reinforcement of the both-sides section -- abbreviation -- it considers as the same magnitude.

[0029] for this reason -- while it is easily bendable since the reinforcement of that buffer section is weak even if folding progresses and the both-sides section of the folding baseline section 11 begins to buffer in ** -- the reinforcement of the both-sides buffer section -- abbreviation -- since it is the same, as it can prevent that a gap arises in crease sources and it

is shown in drawing 2 (III), along with the folding baseline 11, it can bend very with high precision.

[0030] Supplying the above-mentioned corrugated board 1 to folder gluer, and making the corrugated board 1 transport in the direction of an arrow head of drawing 1 Since the auxiliary line sections 12a and 12b of a pair incline in the opposite direction when bending the folding baseline section 11 sequentially from the tip of the migration direction, The stress at the time of folding is bent with the auxiliary line sections 12a and 12b, and it can concentrate on the intersection of the baseline section 11, and it can be bent very with high precision along with the above-mentioned folding baseline section 11.

[0031] If it bends to the field which serves as an outside at the time of folding of a corrugated board 1, the baseline section 11 is countered and the reverse ruled line 13 is formed as shown in drawing 3 , it bends with the reverse ruled line 13, and since the reinforcement between the baseline sections 11 becomes still weaker, it is more bendable to high degree of accuracy along with the above-mentioned folding baseline section 11.

[0032] Drawing 4 (I) shows the gestalt of operation of ***** equipment. This ***** equipment has the die plate 21 by which opposite arrangement was carried out in plate-like Annville 20 and its Annville 20, and Annville 20 and a die plate 21 are moved relatively.

[0033] The die board 22 is attached in the inferior surface of tongue of a die plate 21, and the band-like ruled line cutting edge 23 is planted in the die board 22.

[0034] As for edge-of-a-blade section 23a of the ruled line cutting edge 23, along with the both sides of a projection and its lobe, the band-like members 24a and 24b are caudad attached from the inferior surface of tongue of the die board 22.

[0035] As shown in drawing 5 (I) and (II), the band-like members 24a and 24b consist of an elastic body made from the mixture of rubber, a cork, or its both etc., and let the front face be an inclined plane 25. In an inclined plane 25, necessary spacing is set in the die-length direction, the inclination slot 26 is formed, and the protruding line 27 of the letter of an inclination is formed between the adjoining inclination slots 26.

[0036] The protruding line 27 overlaps in the adjoining die-length direction of a protruding line 27 and the band-like members 24a and 24b. Moreover, the protruding line 27 inclines in the reverse sense to the protruding line 27 formed in the band-like member of another side. Here, the protruding line 27 of the both sides of the ruled line cutting edge 23 may be formed in bilateral symmetry by making the above-mentioned ruled line cutting edge 23 into a symmetry line, and may shift and form a location in the die-length direction of the ruled line cutting edge 23.

[0037] In the condition of having supplied the corrugated board 1 on Annville 20 now, by moving the Annville 20 and die plate 21 in the direction approached relatively, as shown in drawing 4 (II), a corrugated board 1 is crushed with the ruled line cutting edge 23, and is ***** (ed) in the shape of a muscle. Moreover, while the both sides of ***** are crushed by the band-like members 24a and 24b, the letter of an inclination crushes by the protruding line 27, and it is put into a slot, and as shown in drawing 4 (II), the folding baseline section 11 and the auxiliary ruled line sections 12a and 12b are formed.

[0038] Drawing 6 (I) shows other examples of ***** equipment. This ***** equipment plants the ruled line cutting edge 23 and the band-like members 30 and 30 of the pair which consists of a metal in the die board 22 attached in the die plate 21, and is pressing the spacer 31 fit between each push crushing members 30 and 30 and the ruled line cutting edge 23.

[0039] Moreover, as shown in drawing 6 (II), the circular end face 32 was formed in the band-like member 30, necessary spacing was set in the die-length direction of the circular end face 32, the inclination slot 33 was formed in it, and the protruding line 34 of the letter of an inclination is provided between the adjoining inclination slots 33.

[0040] Here, the protruding line 34 is overlapped in the die-length direction of the band-like member 30 to the adjoining protruding line 34, and the protruding line 34 inclines in the reverse sense to the protruding line 34 formed in the band-like member 30 of another side. The protruding line 34 of a pair may be formed in bilateral symmetry by making the ruled line cutting edge 23 into a symmetry line, and may shift and form a location in the die-length direction of the ruled line cutting edge 23.

- [0041] Furthermore, the above-mentioned ruled line cutting edge 23 and the strip 35 which changes from synthetic resin to the location which counters were attached in Annville 20 through the adhesives layer 36 in which it was prepared at the tooth back, the front face of the above-mentioned strip 35 was countered with the above-mentioned ruled line cutting edge 23, and straight-line-like ***** 37 is formed in it.
- [0042] In the above-mentioned ***** equipment, by supplying a corrugated board 1 on Annville 20, and moving the Annville 20 and die plate 21 in the direction approached relatively, the front-face side of a corrugated board 1 is crushed by the ruled line cutting edge 23 and the band-like member 30, a rear-face side is crushed by ***** 37, and the corrugated board 1 shown in drawing 3 is formed.
- [0043] Drawing 7 (I) shows the gestalt of the operation of further others of ***** equipment. This ***** equipment had the Annville cylinder 40 and the die cylinder 41 arranged in that upper part, and has attached the band-like ***** member 43 which changes from synthetic resin to the die board 42 attached in the periphery of the above-mentioned die cylinder 41 through means, such as adhesion.
- [0044] As shown in drawing 7 (II), it crushes on both sides of ***** 44 for ***** , and its ***** 44, and the step 45 of the pair of business is formed in the crosswise center, necessary spacing is set in the surface die-length direction of each step 45, the inclination slot 46 is formed in it, and the protruding line 47 which inclines to ***** 44 between the adjoining inclination slots 46 is formed in the ***** member 43.
- [0045] The protruding line 47 overlaps in the die-length direction of a step 45 to the adjoining protruding line 47, and the protruding line 47 inclines in the reverse sense to the protruding line 47 formed in the step 45 of another side.
- [0046] In the ***** equipment which consists of the above-mentioned configuration, by rotating the Annville cylinder 40 and the die cylinder 41 in the direction of an arrow head, and sending in a corrugated board 1 between both the cylinder 40 and 41, a corrugated board 1 is ***** (ed) and the corrugated board 1 shown in drawing 1 is formed.
- [0047] In addition, in the gestalt of operation shown in drawing 4 , drawing 6 , and drawing 7 , ***** is given at the same time it pierces on the die boards 22 and 42 in fact, and a cutting edge is attached and a corrugated board 1 is pierced by the predetermined configuration with the blanking cutting edge.

[Translation done.]

* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The front view of the corrugated board which gave the ruled line concerning this invention

[Drawing 2] (III) is the sectional view in which (I) shows the expanded sectional view of drawing 1, and (II) shows the middle of folding, and the sectional view showing a perfect folding condition.

[Drawing 3] The sectional view of the corrugated board which gave the reverse ruled line

[Drawing 4] For (I), (II) is the sectional view showing the gestalt of operation of the ***** equipment concerning this invention, and the sectional view showing a ***** condition.

[Drawing 5] For (I), (II) is the perspective view showing a die board same as the above, and the perspective view in which crushing and showing a member.

[Drawing 6] For (I), (II) is the sectional view showing the gestalt of other operations of ***** equipment, and the perspective view showing some die boards of (I).

[Drawing 7] The sectional view of ***** equipment showing the gestalt of other operations further and (II) crush, and (I) is the perspective view of a member.

[Drawing 8] The front view which shows gradually (I), (II), and (III) like the formation fault of a carton box

[Drawing 9] The sectional view of a blank

[Drawing 10] (I) and (II) are the front view showing a defect's carton box.

[Description of Notations]

11 Folding Baseline Section

12a, 12b Auxiliary line section

20 Annville

22 Die Board

23 Ruled Line Cutting Edge

24a, 24b Band-like member

27 Protruding Line

35 Strip

40 Annville Cylinder

41 Die Cylinder

42 Die Board

43 ***** Member

44 ****

45 Step

47 Protruding Line

[Translation done.]